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63Cu NMR Evidence for Enhanced Antiferromagnetic Correlations around Zn Impurities in YBa2Cu3O6.7

Julien M., Fehér T., Horvatić M., Berthier C., Bakharev O., Ségransan P., Collin G., Marucco J.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Doping the high-Tc, superconductor YBa2Cu3O6.7- with 1.5% of nonmagnetic Zn impurities in CuO2 planes is shown to produce a considerable broadening of 63Cu NMR spectra, as well as an increase of low-energy magnetic fluctuations detected in 63Cu spin-lattice relaxation measurements. A modelindependent analysis demonstrates that these effects are due to the development of staggered magnetic moments on many Cu sites around each Zn and that the Zn-induced moment in the bulk susceptibility might be explained by this staggered magnetization. Several implications of these enhanced antiferromagnetic correlations are discussed.